

**PATENT COOPERATION TREATY**  
**PCT**  
**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**  
(PCT Article 36 and Rule 70)

REC'D 13 DEC 2004

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Applicant's or agent's file reference 29993/X321 / 32 AH	<b>FOR FURTHER ACTION</b>	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. <b>PCT/NZ2003/000215</b>	International Filing Date (day/month/year) 19 September 2003	Priority Date (day/month/year) 19 September 2002
International Patent Classification (IPC) or national classification and IPC <b>Int. Cl. <sup>7</sup> G02B 27/02, G02F 1/1335, 1/1347, G09F 19/14</b>		
Applicant <b>DEEP VIDEO IMAGING LIMITED et al</b>		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
- ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheet(s).

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 23 January 2004	Date of completion of the report 2 December 2004
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer  <b>MICHAEL HALL</b> Telephone No. (02) 6283 2474

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**I. Basis of the report****1. With regard to the elements of the international application:\***

- ☐ the international application as originally filed.
- ☒ the description, pages **1-14**, as originally filed,  
pages , filed with the demand,  
pages , received on with the letter of
- ☒ the claims, pages , as originally filed,  
pages , as amended (together with any statement) under Article 19,  
pages , filed with the demand,  
pages **15-17**, received on **24 November 2004** with the letter of **24 November 2004**
- ☒ the drawings, pages **1-4**, as originally filed,  
pages , filed with the demand,  
pages , received on with the letter of
- ☐ the sequence listing part of the description:  
pages , as originally filed  
pages , filed with the demand  
pages , received on with the letter of

**2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.**

These elements were available or furnished to this Authority in the following language which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

**3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:**

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

**4. ☒ The amendments have resulted in the cancellation of:**

- ☐ the description, pages
- ☒ the claims, pages **18, 19**
- ☐ the drawings, sheets/fig.

**5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\***

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

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**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Claims 1-13	YES
	Claims	NO
Inventive step (IS)	Claims 1-13	YES
	Claims	NO
Industrial applicability (IA)	Claims 1-13	YES
	Claims	NO

**2. Citations and explanations (Rule 70.7)**Citations

D1 : DE 19920789

D2 : JP 2002-099223

D3 : JP 11-205822

D4 : GB 2372618

D5 : WO 2000/048167

D6 : WO 2001/095019

D7 : US 5112121

D8 : DE 2730785

D9 : WO 2000/036578

NOVELTY (N) AND INVENTIVE STEP (IS)

Each of D1 and D2 teaches a single-screen display (such as an LCD display) that presents different interlaced images to different viewing angles via a lenticular array film. D3 teaches a single-screen LCD display that presents different images to different viewing angles via a parallax barrier. D4 teaches a single-screen static display that presents different interlaced images to different viewing angles via an optical mask sheet. D5 teaches using a reflective single-screen display layer to display a clock face and a photograph at different viewing angles.

D6 teaches a two-screen display where different images, displayed on an overlapping LCD screen and holographic or prism sheet screen respectively, are presented to different viewing angles via a polarising film. D7 teaches a two-screen display where different images, displayed on overlapping holographic screens, are displayed to different viewing angles, via control of projector angles/colours. D8 teaches a two-screen static display where different (interlaced) images, displayed on overlapping screens, are displayed to different viewing angles via a lenticular lens sheet. D9 teaches two a two-screen LCD display where different images, displayed on overlapping screens (page 9 lines 2-3 of D9) are displayed in opposite directions by appropriate software.

However, no obvious combination of the prior art teaches or suggests two overlapping planar video display screens with adjustable transparency to control visibility through the overlapping portion, and where images displayed on the screens are respectively viewable only at different viewing angles or ranges of viewing angles, as per claim 1. Hence this claim, and consequently dependent claims 2-13, are novel and have inventive step.

INDUSTRIAL APPLICABILITY (IA)

The subject matter of the claims is applicable to the industrial manufacture of multiple layer displays.

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CLAIMS

1. A multiple layer display comprising:
  - a first substantially planar display layer,
  - 5 a second substantially planar display layer overlapping at least a portion of the first display layer and positioned substantially parallel thereto, the first and second display layers capable of displaying first and second video images respectively thereon and the transparency of the second layer being adjustable to control the visibility of the overlapping portion of the first display layer through the second display layer,
  - 10 wherein the first and second display layers include image directing means which direct the images displayed thereon in first and second directions, or ranges of directions, respectively so that the images displayed on the first and second display layers are viewable only at first and second viewing angles or ranges of viewing angles respectively, and
  - 15 wherein the first and second viewing angles or ranges of viewing angles are not the same.
2. A multiple layer display as claimed in claim 1, wherein the first and second display layers are both liquid crystal display layers.
- 20 3. A multiple layer display as claimed in claim 1 or claim 2, wherein a diffusion means is provided between the overlapping portions of the first and second display layers to reduce moiré interference therebetween.
- 25 4. A multiple layer display as claimed in any one of the preceding claims, wherein there is no overlap between the viewing angles or range of viewing angles of the first display layer and the viewing angle or range of viewing angles of the second display layer.
- 30 5. A multiple layer display as claimed in any one of claims 1 to 3, wherein there is some overlap between the viewing angles or range of viewing angles of the first display layer and the viewing angle or range of viewing angles of the second display layer.

6. A multiple layer display as claimed in any one of the preceding claims,  
wherein viewing angle enhancing means are applied to at least one of said first  
and second display layers to increase the range of viewing angles at which an  
image displayed on said at least one display layer is viewable.
7. A multiple layer display as claimed in claim 6, wherein said viewing angle  
enhancing means comprises a wide angle viewing diffuser positioned in front  
of one of said display layers.
8. A multiple layer display as claimed in any one of the preceding claims,  
wherein the image directing means comprise at least one of:
- i) light control film,
  - ii) holographic diffusion film,
  - iii) prismatic film,
  - iv) a parallax barrier, and/or
  - v) a lenticular lens.
9. A multiple layer display as claimed in any one of the preceding claims,  
wherein the image directing means controls the cell structure of the liquid  
crystal within at least one of the first or second display layers.
10. A multiple layer display as claimed in any one of the preceding claims,  
wherein the image directing means is formed by arranging the liquid crystal  
molecules within at least one of the first or second display layers at a  
predetermined angle to the surface of that display layer.
11. A multiple layer display as claimed in any one of claims 1 to 4, wherein the  
image displayed on one display layer is made up of separate interlaced primary  
and secondary images and a viewing angle dependent filtering means is  
provided in front of said display layer,
- wherein the primary image is viewable from a range of primary  
viewing angles and the secondary image is viewable from range of secondary  
viewing angles, and

wherein the range of primary viewing angles overlaps with either the first or second range of viewing angles of the other display layer and the range of secondary viewing angles overlaps with the second or first range of viewing angles of the other display layer.

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12. A multiple layer display as claimed in claim 11, wherein the viewing angle dependent filtering means comprises a lens stripe pattern.

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13. A multiple layer display as claimed in any one of the preceding claims wherein additional substantially planar, selectively transparent, display layers are provided beneath the second display layer overlapped with said first and second display layers.

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